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19 September 1963

MEMORANDUM FOR THE RECORD

SUBJECT : Trip Report to G.E. Advance Technology Laboratories (GE-ATL), Schenectady, New York, 16-17 September 1963.

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REFERENCE : Trip Report to GE-ATL, 9 September 1963 (3207-63)

1. The undersigned visited GE-ATL to review contractor's work on DD-2020. Contractor results are satisfactory.

2. The development of basic information has continued. Recently, it has been found that pulsed operation of the PEB will make it possible to decrease the diameter of the beam-forming chamber from the 11 inches necessary for CW operation, to about 4 inches diameter for pulsed operation. This is a major improvement in the direction of a compact, light-weight, plasma electron source.

3. Contractor has received a SAMES electrostatic generator of 8 KW-200 KV rating. After acceptance runs are made, the generator will be exploited for the project. Possibilities of vacuum operation will be explored. This high-voltage generator will weigh about 12 lbs., exclusive of the vacuum shell around it.

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4. Contractor has gotten design information from , on the hydraulic motor to run the SAMES generator. There is an entire family of hydraulic motors from which off-the-shelf selections can be made. An example of the performance characteristics of the motor:

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15,700 rpm at 3000 psi: 8.3 horsepower
3,000 rpm at 3000 psi: 2.1 horsepower

GROUP 1
Excluded from automatic
downgrading and
declassification

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The foregoing motor weighs 1.8 lbs. and is the size of a coffee cup.

5. The high-voltage equipment at hand can be used up to 20 KW for bench tests of the PEB gun, in order to determine if there is any foreseeable limit to the power output of the gun.

6. Cryopumping experiments are proceeding. It is expected that a low temperature, low-weight, system can replace the heavier mechanical pumps. The overall weight of a cryogenic pump is not expected to be over 5 lbs.

7. High-temperature electronic components (300° C) have been received and are being assembled for control circuitry. These units are designated as TIMM (thermionic integrated micro-module) components and were developed for space research programs.

8. Contractor was exhorted again to press on to more compact lightweight components in the KEMPSTER B system. While it is really too early to determine weights for KEMPSTER B, the undersigned believes that KEMPSTER B can be built compact and in the 25-35 lb. range, including all of the required power-generating equipment, controls, pumping system, etc. Furthermore, the simplifications indicate a high-degree of reliability should be present in the equipment.

9. Work is proceeding on Part II of the wave-guide attenuation experiment.

10. Further discussions are underway with contractor on the 2nd generation R-F powered accelerator.

SIGNED

Engineering and Analysis Division
(Special Activities)

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- 2 - AD/OSA
- 3 - D/TECH/OSA
- 4 - CD/OSA
- 5 - EAD/OSA chrono
- 6 - RB/OSA

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